Fermi National Accelerator Laboratory
LDRD Project Data Sheet - FY14

Project ID: FNAL-LDRD-2014-025
Project title: The Sinuous Target
Principal investigator: Robert Zwaska

Project description: (short description and explanation of cutting edge, high-risk, high-potential science or engineering)

The project is to generate a new, engineered material for use in high-power accelerator targets. The material will be composed of a multitude of interlaced wires of small dimensions. The material will have improved resistance to thermal shock and the interlaced nature of the wires will have mechanical benefits. The material will allow for targets to take higher incident power with more efficient secondary beam production.

Tie to Mission: (explain the project's relevance or anticipated benefits to Fermilab's and DOE's missions)

A high-power target is an integral part of a neutrino beam, muon beam, other intensity frontier beams for high energy physics as well as neutron and rare isotope beams outside of high energy physics. Thermal, mechanical, and radiation effects limit the degree to which targets can be subject to high incident beam power. If successful, the material developed has applications at accelerators at Fermilab and within the DOE complex. There will be some focus on these materials in particular for neutrino targets.

Previous year's accomplishments: (as applicable) FY14, not applicable

Work proposed for current fiscal year and anticipated / desired results:

The project proposes to develop descriptive models of the material types to be tested and to describe the expected bulk properties associated with the interlaced design. A rough prototype will be produced and options for production with suitable materials will be investigated. It is hoped that the modeling will show significant possible benefits that justify the need to make and then test prototype targets from the new materials.

Project funding profile: (costs, budgets, projected budgets, and total)

Prior year(s) costs	FY14	FY15	FY16	Total
N/A	82135	467873	-	550008